IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA
ALEXANDRIA DIVISION

WALKER DIGITAL, LLC, Plaintiff, v. CAPITAL ONE SERVICES, LLC, et al. Defendants.	)	Civil Action No. 1:10cv212 (JFA)

DECLARATION OF MICHAEL SHAMOS, PH.D, J.D. IN SUPPORT OF DEFENDANTS' MOTION FOR SUMMARY JUDGMENT OF NON-INFRINGEMENT

I, Michael Shamos, declare as follows:

1. The following facts are within my personal knowledge and, if called and sworn as a witness, I would testify competently to them.

2. My name is Michael I. Shamos. I hold the title of Distinguished Career Professor in the School of Computer Science at Carnegie Mellon University in Pittsburgh, Pennsylvania. I was a founder and Co-Director of the Institute for eCommerce at Carnegie Mellon and I now direct a graduate degree program in eBusiness Technologies. My résumé is attached as Exhibit 1 to this declaration.

3. I teach graduate courses at Carnegie Mellon in Electronic Commerce, including eCommerce Technology, Electronic Payment Systems, Electronic Voting and eCommerce Law and Regulation and have done so since 1999. Since 2007 I have also been teaching Law of Computer Technology. From 1979-1987 I was the founder and president of two computer software development companies in Pittsburgh, Pennsylvania: Unilogic, Ltd. and Lexeme Corporation.

4. I am an attorney admitted to practice in Pennsylvania and have been admitted to the Bar of the U.S. Patent and Trademark Office since 1981. I have not been asked to offer any legal opinions in this action.

5. I have previously testified in a number of cases concerning computer technology, particularly in cases involving electronic payment systems, online credit applications and credit card systems.

6. I have been retained as a technical expert by the law firm of Morrison & Foerster LLP on behalf of Defendants (collectively, "Capital One") in this action. I have been asked by counsel for Defendants to respond to the "Statement of Richard E. Korf" ("Korf Statement"),

dated May 24, 2010 and filed with Walker Digital, LLC's Opposition to Defendant Capital One's Motion for Summary Judgment of Non-Infringement.

7. I have been engaged through Expert Engagements LLC ("EE"), a firm that locates expert services for law firms. EE charges $550 per hour for my regular services, of which I receive $495. I am one of the owners of EE. No part of my compensation is dependent on the outcome of this case.

8. I have reviewed the patents in suit, their prosecution histories, and the cited prior art. I have also reviewed the materials cited in the Korf Statement.

9. I do not agree with Plaintiff's proposed construction of "price for a credit account." Nevertheless, for the purposes of this declaration only, I will assume that Plaintiff's proposed construction, "ascertaining an exchange of value expressed as the composite credit or account parameters that a credit card issuer is willing to offer a customer together with any fee or credit for modifying or entering into the credit account," is correct.

10. Dr. Korf states in paragraph 4 that he employed Capital One's construction of "calculate" and "calculating" as "computing using a mathematical formula."

11. Paragraphs 11-13 and 17-19 of the Korf Statement are devoted to an elaborate and unnecessary exposition to the effect that set operations can be represented by formulas utilizing set notation and set operations. These set operation formulas would not be understood by one of ordinary skill in the art (as defined in paragraph 21 of the Korf Statement) to be "mathematical formulas" in light of the specifications in the patents in suit. The patents in suit describe calculations of a numerical value (e.g., $28.80) using basic arithmetic such as multiplication and addition. Set theory is a branch of abstract mathematics far outside the scope of and completely irrelevant to the patents suit. A person of skill in the art reading the patents in suit in a non-

litigation context would never think that the term "mathematical formula" included set operations.

12. Furthermore, even assuming that set operations could properly be used within the context of the patents in suit, the possibility that the arithmetical operations described in the patents might be expressed in set-theoretic terms does not mean that set theory or set functions are actually used to carry out those operations. The fact that something is expressible in terms of a mathematical formula does not demonstrate that it *uses* a mathematical formula in a calculation. For example, the trajectory of a thrown baseball obeys various physical laws that can be expressed a mathematical formulas. Yet no one would say that a baseball uses a mathematical formula to compute its own path simply because that path can be expressed as a mathematical formula. Likewise, the mere fact that a computer program arrives at a result that might be expressible in terms of a mathematical formula does not mean that the program used that formula in performing its work.

13. The Card Lab code that Dr. Korf identifies in his Statement does not use any set intersection or set union operations. This can be seen simply from inspecting the code: none of the "formulas" that Dr. Korf contends Card Lab uses actually exists in the code. The fact that Dr. Korf can rewrite certain functions of Card Lab abstractly in terms of set intersection or set union operations is immaterial to the issue of whether Card Lab actually *uses* set intersection or set union operations.

14. It is not correct, as averred in paragraph 9 of the Korf Statement, that "one of the core computational tasks in Capital One's Card Lab system is set intersection." No items in Card Lab are represented as sets, and no set operations appear in the source code. Dr. Korf is mistaken in alleging that Mr. Mastro's declaration supports any such conclusion. What Mr.

Mastro said was, "When a user selected (or unselected) a term, Card Lab looped through the products associated with the selected term and compared those products against the available products in the temporary products array. If the consumer-selected term did not match the term of a product in the temporary products array, that product was removed from the temporary products array." This describes looking for a card that possesses a particular attribute. It is not set intersection, and Dr. Korf has not identified which sets it might be that are being intersected. As explained in paragraph 13 of the Korf Statement, set C is the intersection of sets A and B. In paragraph 14, Dr. Korf states that A, B and C are "sets of credit card identifiers." However, no such "sets" are maintained. There is a "temporary products array," which is successively whittled down, and no set intersection is even performed.

15. Even if it were true that Card Lab performed set operations, no such operations are used to calculate a price even under Plaintiff's construction of price. At most any set operations are used to narrow down the collection of cards. Assuming Walker's construction of price, and assuming that the set of terms presented via Card Lab are the price (which is not conceded), the price of each card is predetermined, is not calculated according to a formula, and is simply looked up. Dr. Korf has failed to find any such supposed formula in the Card lab source code.

16. It is not correct, as averred in paragraph 15 of the Korf Statement, that "another of the core computational tasks in Capital One's Card Lab system is set union." This is false for the same reason that his statement in paragraph 9 is incorrect, as explained above, and there is nothing in Mr. Mastro's declaration that supports such a conclusion.

I declare under penalty of perjury that the foregoing is true and correct. Executed on May 27, 2010.

Michael Ian Shamos